**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**
**Before the Board of Patent Appeals and Interferences**

In re Patent Application of
Atty Dkt. 900-555
C# M#
Confirmation No. 5078

Yoshikazu KAWAGOE et al.
TC/A.U.: 1735

Serial No. 10/584,712
Examiner: Devang R. PATEL

Filed: June 26, 2006
Date: June 3, 2011

Title: SOLAR BATTERY MODULE PRODUCTION METHOD AND SOLAR BATTERY MODULE PRODUCTION APPARATUS

**Mail Stop Appeal Brief - Patents**
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

☒ **Correspondence Address Indication Form Attached.**

☐ **NOTICE OF APPEAL**
Applicant hereby **appeals** to the Board of Patent Appeals and Interferences from the last decision of the Examiner twice/finally rejecting applicant's claim(s). $540.00 (1401)/$270.00 (2401) $

☒ An appeal **BRIEF** is attached in the pending appeal of the above-identified application $540.00 (1402)/$270.00 (2402) $ 540.00

☐ Credit for fees paid in prior appeal without decision on merits -$ ( )

☐ A reply brief is attached. **(no fee)**

☐ Petition is hereby made to extend the current due date so as to cover the filing date of this paper and attachment(s)
One Month Extension $130.00 (1251)/$65.00 (2251)
Two Month Extensions $490.00 (1252)/$245.00 (2252)
Three Month Extensions $1110.00 (1253/$555.00 (2253)
Four Month Extensions $1730.00 (1254/$865.00 (2254) $

☐ "Small entity" statement attached.

Less month extension previously paid on -$( )

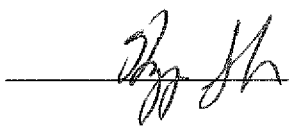
**TOTAL FEE ENCLOSED $ 540.00**

☒ **CREDIT CARD PAYMENT (FORM ATTACHED IF PAPER FILING).**

Any future submission requiring an extension of time is hereby stated to include a petition for such time extension. The Commissioner is hereby authorized to charge any deficiency, or credit any overpayment, in the fee(s) filed, or asserted to be filed, or which should have been filed herewith (or with any paper hereafter filed in this application by this firm) to our **Account No. 14-1140.**

901 North Glebe Road, 11th Floor
Arlington, Virginia 22203-1808
Telephone: (703) 816-4000
Facsimile: (703) 816-4100
HNS/edg

NIXON & VANDERHYE P.C.
By Atty: Hyung N. Sohn, Reg. No. 44,346

Signature: 

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| | |
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| Yoshikazu KAWAGOE et al. | Atty. Ref.: 900-555 |
| Serial No. 10/584,712 | TC/A.U.: 1735 |
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For: SOLAR BATTERY MODULE PRODUCTION METHOD AND SOLAR BATTERY MODULE PRODUCTION APPARATUS

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June 3, 2011

**MAIL STOP APPEAL BRIEF - PATENTS**
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

**APPEAL BRIEF**

Sir:

Appellants hereby appeal to the Board of Patent Appeals and Interferences from the last decision of the Examiner as indicated in the Office Action dated January 03, 2011 (*hereinafter Office Action*).

**TABLE OF CONTENTS**

## (I) REAL PARTY IN INTEREST

The real party in interest is Sharp Kabushiki Kaisha of Japan.

## (II) RELATED APPEALS AND INTERFERENCES

The appellants, the undersigned, and the assignee are not aware of any related appeals, interferences, or judicial proceedings (past or present), which will directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

## (III) STATUS OF CLAIMS

Claims 1–12 and 25–28 are pending, finally rejected and appealed.

## (IV) STATUS OF AMENDMENTS

No amendments have been filed since the date of the Final Rejection.

## (V) SUMMARY OF CLAIMED SUBJECT MATTER

The disclosed subject matter relates to, at least in part, to a solar battery module production apparatus, and to base solar battery module production method using the production apparatus.

Conventionally, solar battery cells are connected in series by bonding interconnectors to electrodes of the solar battery cells. In a production process, a solar battery string is prepared by serially connecting light receiving surface electrodes and rear surface electrodes of adjacent solar battery cells by the elongated interconnectors, typically through welding or soldering.

In a conventional soldering method, an interconnector is placed on a solder–coated electrode of a solar battery cell, and soldering is generally achieved by locally applying hot air to the electrode while pressing the interconnector by a press pin, or by locally irradiating the electrode using a heater. But with an increasing demand for solar battery cells, more productive and efficient soldering method is required. *Disclosure, p.1, l.6 – p.2, l.17.*

In one or more aspects of the present disclosure, a production apparatus is used in a solar battery module production method. The solar battery module is produced by electrically connecting a plurality of solar battery cells to one another by interconnectors. A non limiting embodiment of a solar battery string 10 is illustrated in Figs. 12 and 13 reproduced below. Fig. 12 is a plan view and Fig. 13 is a bottom view of the solar batteries string 30 in which the solar battery cells are connected to one another by interconnectors. *Disclosure p.12, ll.17–23.*

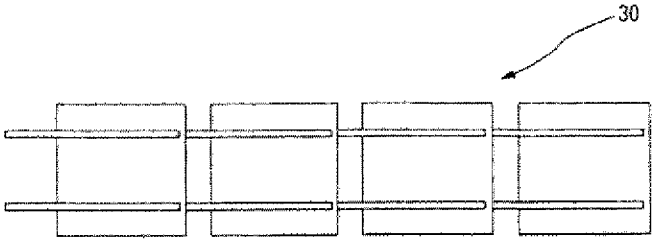



Fig. 12

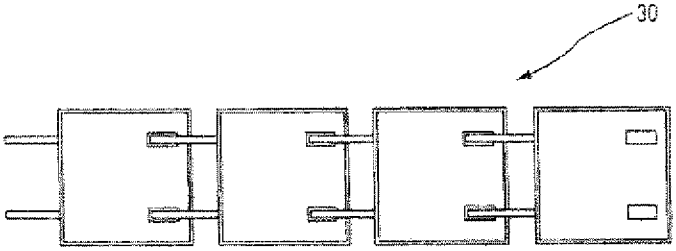



Fig. 13

In a production method, a production apparatus 100 such as the one illustrated in Fig. 1 of the present disclosure (reproduced below) is used.

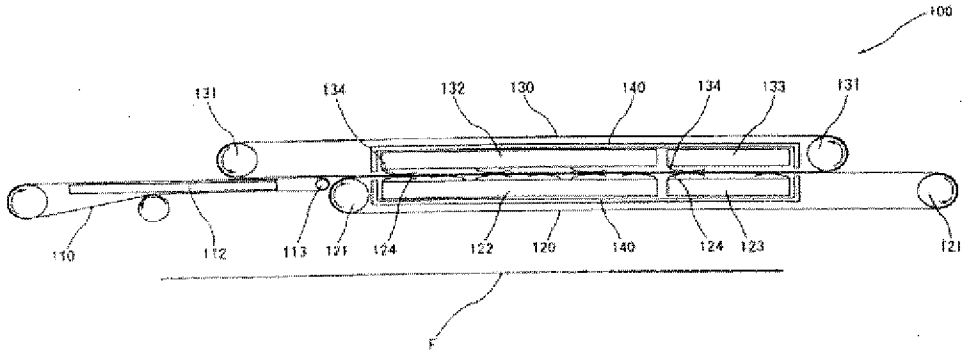



Fig. 1

The production apparatus 100 includes a positioning belt 110 and a heating belt 120 located adjacent each other in a transferable manner. The apparatus 100 also includes and a press belt 130 extending over and in an opposed relation to the positioning belt 110 and the heating belt 120. The apparatus 100 is adapted to control the heating belt 120 and the press belt 130 at predetermined temperatures. *Disclosure, p.15, ll.1–7.*

In the production method, the solar battery cells 10 and the interconnectors 20 are placed on the positioning belt 110 in proper positional relation upstream of the positioning belt 110 and are transported in a

transport direction F to a downstream stream portion as illustrated in Fig. 5(a). *Disclosure, p.16, ll.5-8; p.22, ll.9-16.*

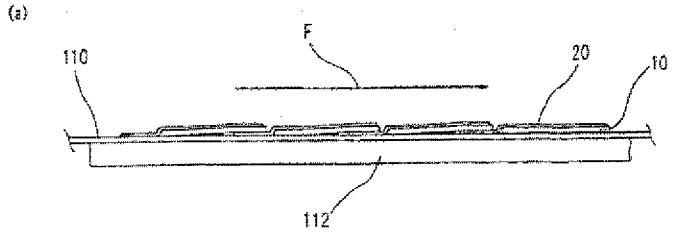



Fig. 5(a)

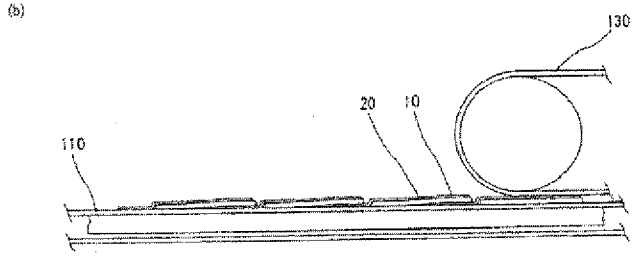



Fig. 5(b)

The press belt 130 functions to press the solar battery cells 10 and the interconnectors 20 from an upper side (i.e. above the cells 10 and interconnectors 20). *Disclosure, p.16, ll.20-24.* The cells 10 and the interconnectors 20 are held between the positioning belt 110 and the press belt 130 while being transported to the heating belt 120. *Disclosure, p.22, ll.16-20.*

The positioning belt 110 has vacuum suction holes 111 aligned in the transport direction F for transporting the solar battery cells 10 and the interconnectors 20 while holding the solar battery cells 10 and the interconnectors 20 in a properly positioned state. *Disclosure, p.16, ll.9-17.*

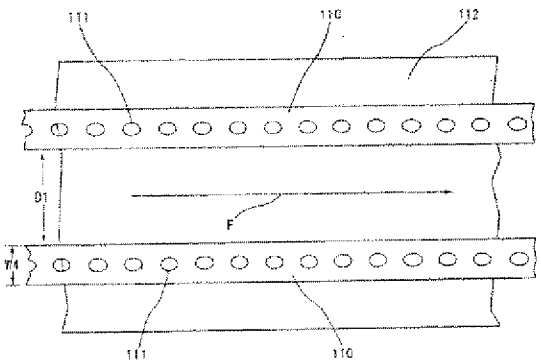



Fig. 2

The cells 10 and the interconnectors 20 transferred to the heating belt 120 are held between the heating belt 120 and the press belt 130 as seen in Fig. 6(c). Also, the interconnectors 20 are soldered to the cells 10 while being continuously transported in the transport direction as seen in Fig. 6(d).

*Disclosure p.15, l.24 – p.16, l.3; p.22, ll.16-25.*

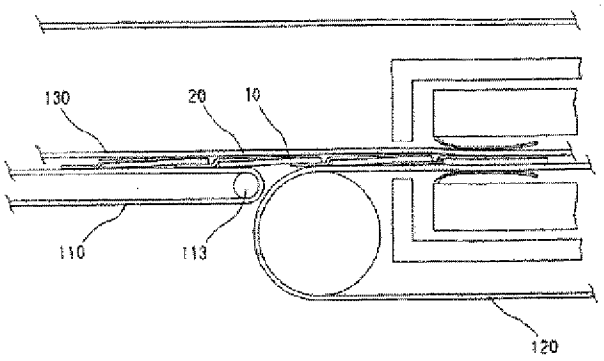



Fig. 6(c)

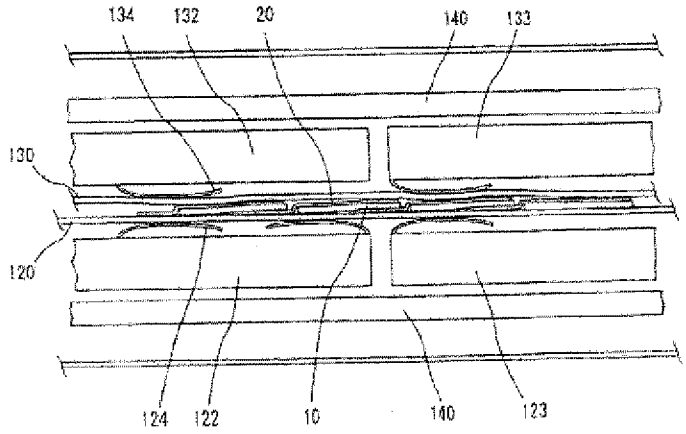



Fig. 6(d)

Heating blocks 122, 132 and cooling blocks 123, 133 are disposed on back sides of the heating belt 120 and the press belt 130. The heating belt 120 and the press belt 130 are respectively controlled at predetermined temperatures by these blocks to solder the cells 10 to the interconnectors 20.

*Disclosure, p.17, ll.16-24; p.22, ll. 20-25; p.24, l.19 – p.25, l.13.*

Unlike the positioning belt 110, the heating belt 120 has no vacuum suction holes as illustrated in Fig. 3. If the heating belt 120 had vacuum

suction holes, the vacuum suction holes would likely be clogged by the melted solder. Also, protuberances may form on surfaces of the interconnectors 20. *Disclosure, p.20, ll.4-20.*

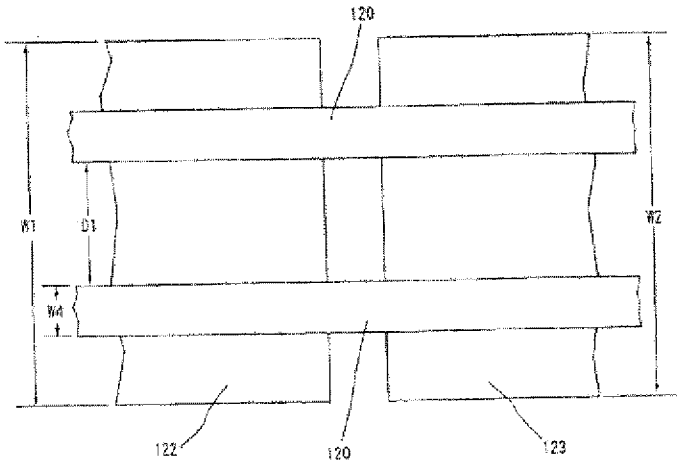



Fig. 3

The following is a mapping of independent and some dependent claims onto non-limiting example text from the specification and figures in the disclosure by reference numerals where appropriate. This mapping is not intended to be used for claim construction.

**A. Independent Claims**

1. A production method for a solar battery module, comprising:

utilizing a production apparatus including a positioning belt and a heating belt located adjacent each other in a transferable manner and a press belt extending over the positioning belt and the heating belt in opposed relation to the positioning belt and the heating belt such that the press belt overlaps at least a portion of the positioning belt, the positioning belt having a vacuum suction hole, and the heating belt having no suction hole, and adapted to

control the heating belt and the press belt at predetermined temperatures *(p.15, l.1 – p.21, l.25; Figs. 1-4)*;

positioning a plurality of solar battery cells and interconnectors required for connection of the solar battery cells on an upstream portion of the positioning belt and transporting the solar battery cells and the interconnectors to a downstream portion of the positioning belt while holding the solar battery cells and the interconnectors in a properly positioned state by the action of the vacuum suction hole *(p.22, ll.9-16; p.23, ll.3-25; Figs. 2, 5(a), 5(b))*;

transferring the solar battery cells and the interconnectors transported to the downstream portion of the positioning belt onto the heating belt while holding the solar battery cells and the interconnectors between the positioning belt and the press belt *(p.22, ll.16-20; p.23, l.20 – p.24, l.5; Figs. 5(a), 5(b), 6(c))*; and

holding the solar battery cells and the interconnectors transferred onto the heating belt between the heating belt and the press belt and soldering the interconnectors to the solar battery cells while transporting the solar battery cells and the interconnectors *(p.22, ll.20-25; p.24, l.15 – p.25, l.13; Figs. 6(c), 6(d))*.

3. The solar battery module production apparatus to be used for a solar battery module production method as recited in claim 1, the production apparatus comprising:

a positioning belt and a heating belt located adjacent each other in a transferable manner (*Figs. 1, 6; p. 15, ll. 1–7*); and

a press belt extending over the positioning belt and the heating belt in opposed relation to the positioning belt and the heating belt (*Figs. 1, 6; p. 15, ll. 1–7*),

wherein the heating belt and the press belt are each controlled at a predetermined temperature, the press belt overlaps at least a portion of the positioning belt (*Figs. 1, 6; p. 15, ll. 1–7;*), the positioning belt has a vacuum suction hole, and the heating belt has no suction hole (*Figs. 2, 3; p. 16, ll. 9-17*).

**B. Dependent Claims**

25. The solar battery module production method as set forth in claim 1, wherein at least one of the heating belt and the press belt is a metal belt *(p. 7, ll. 9-10)*.

26. The solar battery module production apparatus as set forth in claim 3, wherein at least one of the heating belt and the press belt is a metal belt *(p. 7, ll. 9-10)*.

27. The solar battery module production method as set forth in claim 1, wherein the solar battery cells and the interconnectors transported to the downstream portion of the positioning belt are held between the positioning belt and the press belt, and successively transferred from a downstream end of

the positioning belt onto the heating belt while being pressed by the press belt *(p.22, ll.16-26; Figs. 5(a), 5(b), 6(c), 6(d))*.

28. The solar battery module production method as set forth in claim 27, wherein one part of each solar battery cell is held between the heating belt and the press belt while another part of the solar battery cell is held between the positioning belt and the press belt, when the solar battery cell is transferred from the positioning belt onto the heating belt *(p.22, ll.16-26; Figs. 5(a), 5(b), 6(c), 6(d))*.

## (VI) GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

The questions to be decided by the Board are:

- whether claims 1-4 and 11-12 are unpatentable over Shimotomai (US 6,367,530) in view of Toyoma (JP 11278626 A), Meyer (US 4,997,507), and further in view of Tonari (JP 2000-022188 A);
- whether claims 5-10 are unpatentable over the Shimotomai in view of Toyoma, Meyer, and Tonari, further in view of Focke et al. (US 5,674,542, *hereinafter Focke*);
- whether claims 25-26 are unpatentable over the Shimotomai in view of Toyoma, Meyer, and Tonari, further in view of Garbini et al. (US 3,883,386, *hereinafter Garbini*); and
- whether claims 27-28 are unpatentable over the Shimotomai in view of Toyoma, Meyer, and Tonari, further in view of Kataoka et al. (US JP-11-254526 A, *hereinafter Kataoka*).

## (VII) ARGUMENT

All rejections of pending claims should be reversed.

### A. Rejections of Independent Claims 1 and 3 Clearly Erroneous

Independent claim 1 is directed to a production method for a solar battery module. In the production method, the interconnectors are soldered to the battery cells while interconnectors and the battery cells are continuously transported in the transport direction. A production apparatus such as the one illustrated in Fig. 1 of the present disclosure is used, which is again reproduced for convenience.

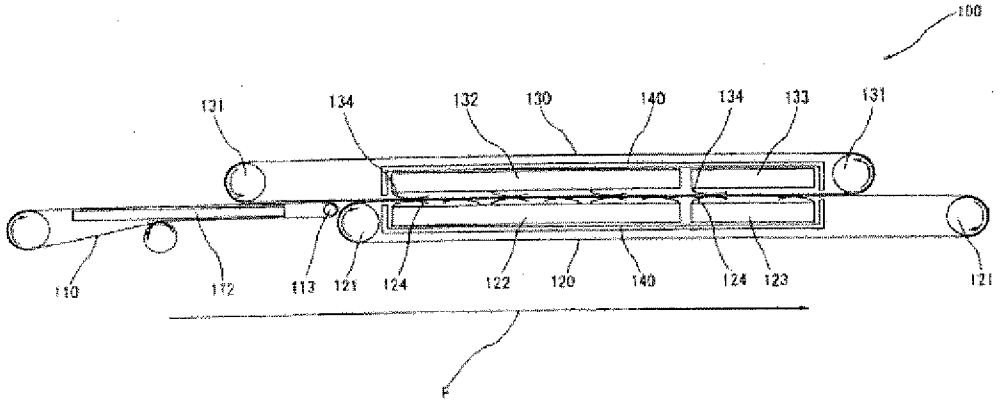


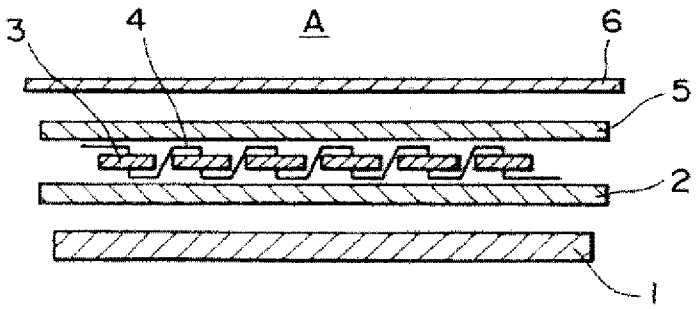

Fig. 1

The production apparatus 100 includes a positioning belt 110, a heating belt 120 and a press belt 130. The positioning belt 110 and the heating belt 120 are located adjacent to each other in a transferable manner, and the press belt 130 extends over the positioning belt 110 and the heating belt 120 in opposed relation to the positioning and heating belts 110, 120.

In the production method, the battery cells 10 and the interconnectors 20 are placed on the positioning belt 110 in proper positional relation upstream

of the positioning belt 110. The positioning belt 110 positions and transports the battery cells 10 and the interconnectors 20 to the adjacent heating belt 120. The press belt 130 extends over both the positioning belt 110 and the heating belt 120, and functions to press the cells 10 and the interconnectors 20 as they are transferred from the positioning belt 110 to the heating belt 120. The press belt 130 also functions to press the cells 10 and the interconnectors 20 as they are soldered while being transported on the heating belt 120. In the claimed production method and apparatus, the solar battery cells are electrically connected to each other through soldering.

In the Office Action, Shimotomai is primarily relied upon to allegedly disclose the features of independent claim 1. Shimotomai is directed to a conveyor apparatus for lamination. Fig. 1 of Shimotomai reproduced below illustrates an example of a multilayer material to be processed, i.e. laminated.



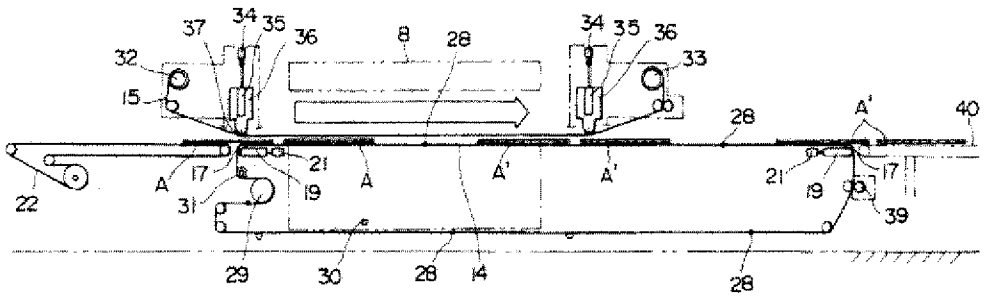

Shimotomai
Fig. 1

The multilayer material A includes photovoltaic modules 3 in between two sheet-like fillers 2, 5. The sheet-like fillers 2, 5 and the photovoltaic modules 3 are stacked on a glass plate 1, and a backing member 6 is disposed in an uppermost position. Ribbon-like electrodes 4 connect the individual photovoltaic modules 3 together. *Shimotomai, c.6, ll.8-16.*

Unlike the claimed invention, Shimotomai is not directed to the production of solar battery modules. The laminating process described in Shimotomai is not for the purpose of electrically connecting the photovoltaic modules 3 to each other. The photovoltaic modules 3 are already electrically connected to each other through the interconnectors 4. Rather, the described process is to laminate the already electrically interconnected photovoltaic modules for protection purposes. Shimotomai describes that filler material such as EVA (ethylene-vinyl-acetate) resin is melted and cured so that the solar panel made of the photovoltaic modules is protected so as to slowdown to degradation of the modules. *Shimotomai, c.1, ll.27-59.*

There are other deficiencies in the Office Action. Recall that in Fig. 1 of the present disclosure, the press belt 130 functions to press the solar battery cells 10 and the interconnectors 20 positioned on an upstream portion of the positioning belt 110. As a result, the cells 10 and the interconnectors 20 are held between the positioning belt 110 and the press belt 130 while being transported to the heating belt 120.

In the Office Action, the Examiner refers to Fig. 11 of Shimotomai (reproduced below) to allege that the claimed features are disclosed. In particular, the Examiner alleges that the carrying-in conveyor 22, the lower side belt 14, and the upper side belt 15 are equivalent to the claimed positioning belt, heating belt, and the press belt, respectively.



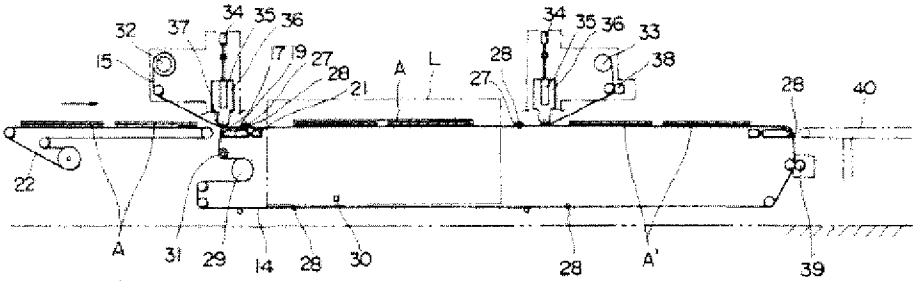

Shimotomai
Fig. 11

Shimotomai describes that the multilayer material A is conveyed from the carrying-in conveyor 22 onto the lower side belt 14 to a position corresponding to the vacuum vessel. Then the conveying is stopped and the multilayer material A is processed, i.e. laminated. After the processing completes, the processed multi-layer material A is conveyed onto the carrying-out conveyor 40 and the next multilayer material to be process is conveyed into the vacuum vessel, and the process repeats. *Shimotomai, c.7, l.38 – c.8, l.50.*

Note that the upper-side belt 15 plays no role whatsoever in transferring the multilayer material A. The multilayer material A is conveyed from the carrying-in conveyor 22 to the lower side belt 14 purely by the movements of the carrying-in conveyor 22 and the lower side belt 14.

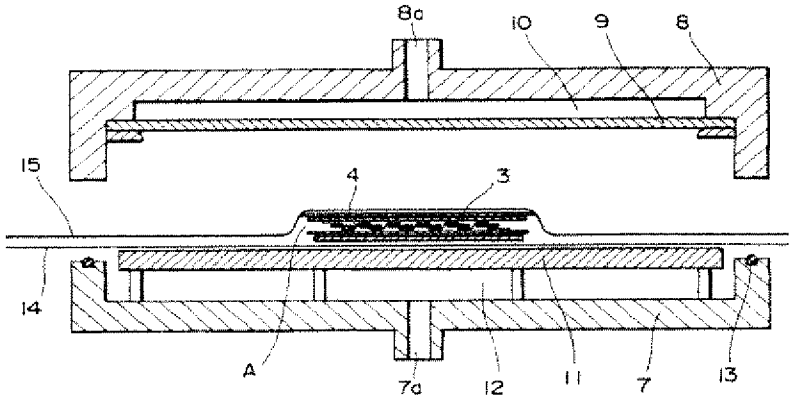
That is, Shimotomai does not teach or suggest the feature of "transferring the solar battery cells and the interconnectors transported to the downstream portion of the positioning belt onto the heating belt while holding the solar battery cells and the interconnectors between the positioning belt and the press belt" of claim 1, which directly contradicts the Examiner's allegation. Toyoma, Meyer and Tonari, individually or in combination, cannot correct this deficiency of Shimotomai.

Figs. 8-15 of Shimotomai illustrate implementation states where the multilayer material A is conveyed by the conveyor apparatus for processing. Initially, multilayer material A is placed on the carrying-in conveyor 22 to be processed in the laminator (Fig. 8). *Shimotomai, c.8, ll.13-18.*

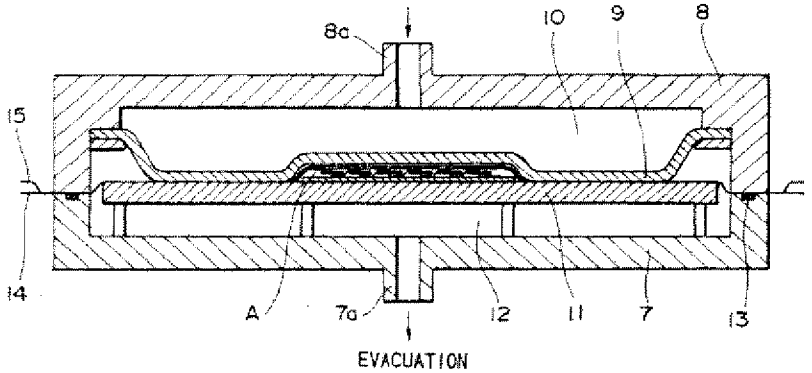



Shimotomai
Fig. 8

In the laminating process, the vacuum vessel 7 is closed by the lid 8 (Figs. 2 and 3).



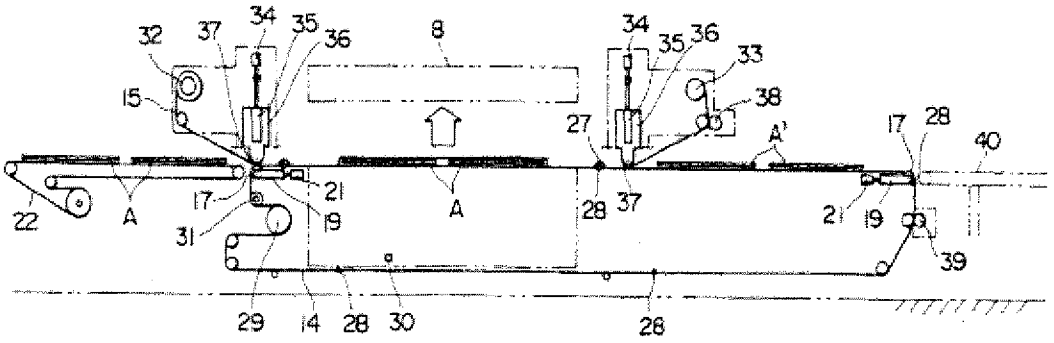

Shimotomai
Fig. 2



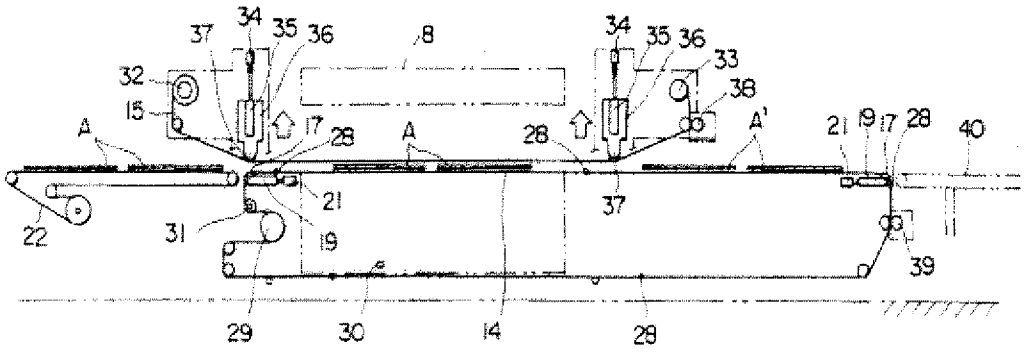

Shimotomai
Fig. 3

Afterwards, the multilayer material A is heated and the vacuum vessel is evacuated so that the multilayer material A is pressed on the heating plate 11 by the diaphragm 9. The fillers 2 and 5 (*see Fig. 1 of Shimotomai*) are melted by the heat and the material A is degassed so that the multilayer material is formed in a laminated body. The laminated body is then taken out. *Shimotomai, c.6, ll.17-43.* While the laminating process is performed, the material is not conveyed in any manner.

The lid 8 of the vacuum vessel 7 is opened (Fig. 9) and the upper side belt 15 is slightly lifted (Fig. 10) after the laminating process completes.

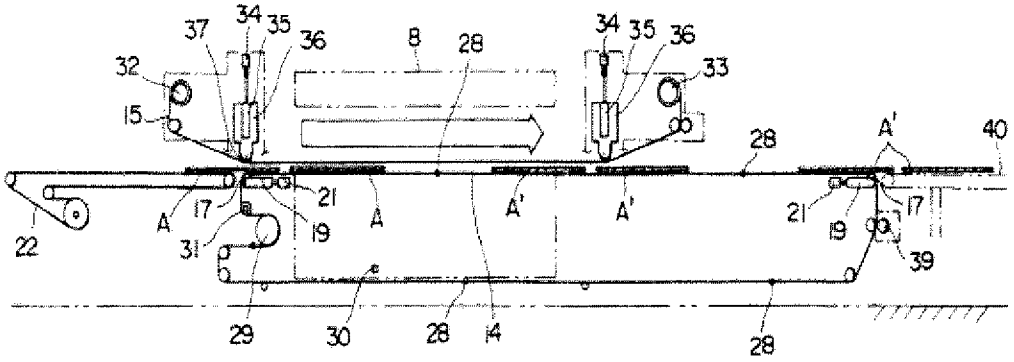



Shimotomai Fig. 9



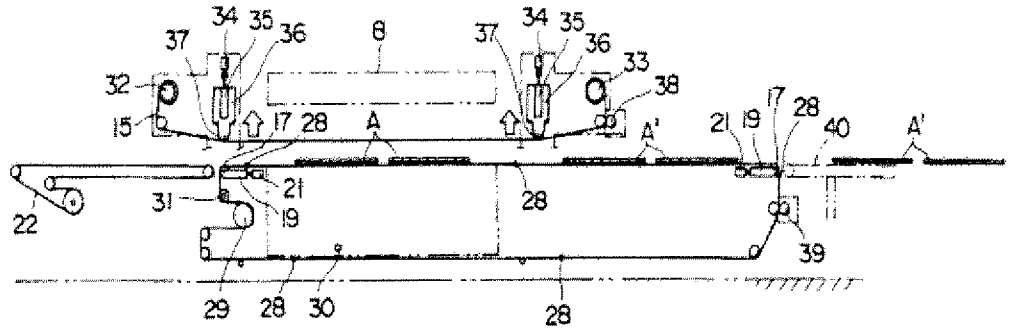

Shimotomai Fig. 10

After the upper side belt 15 is lifted, the multilayer materials A are conveyed (Fig. 11).



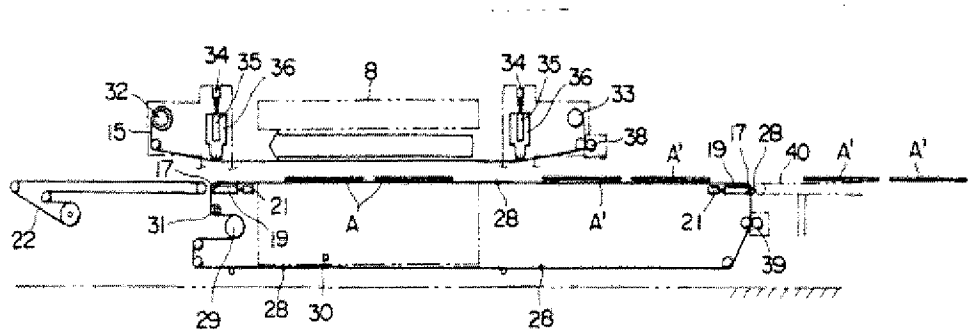

Shimotomai
Fig. 11

The upper side belt 15 is further lifted to a higher position (Fig. 12) after the multilayer materials A are conveyed.



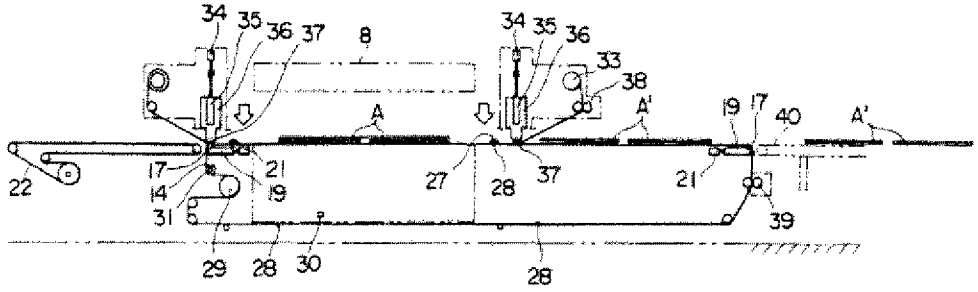

Shimotomai
Fig. 12

The upper side belt 15 is then rewound (Fig. 13).

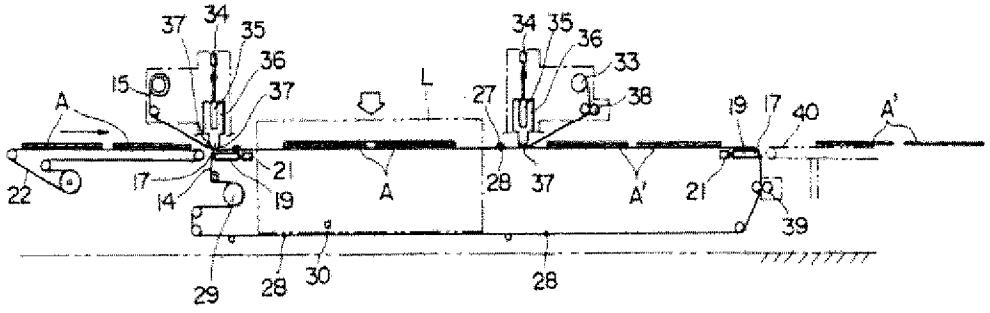



Shimotomai
Fig. 13

The upper side belt 15 is lowered to its original position (Fig. 14) upon completion of rewinding, and the lid 8 is closed (Fig. 15) for another processing. *Shimotomai, c.8, ll.24-50.*




Shimotomai
Fig. 14




Shimotomai
Fig. 15

Shimotomai makes clear that the multilayer material A is never moved while being laminated. Shimotomai also makes clear that the upper side belt 15 is always lifted when the multilayer material A is being conveyed, i.e., it is moved out of the way. The upper side belt 15 plays no role in holding the multilayer material A when the material A is being conveyed. This again indicates that the upper side belt 15 plays no role whatsoever in holding the multilayer material when the material is transported.

The Examiner asserts in the Office Action that "in accordance with the broadest reasonable interpretation, the material A is held between the upper belt 15 and the positioning belt 22, and also held between the upper belt 15 and the lower belt 14." *Officer Action, p.3, ll.1-3.*

However, in Shimotomai, the multilayer material A is never held between the upper side belt (upper belt) 15 and the carrying-in conveyor (positioning

belt) 22, and also never held between the upper side belt 15 and the lower side belt (lower belt) 14, while the multilayer material A is conveyed.

It is evident by referring to Figs. 9-11 of Shimotomai. That is, as shown in Fig. 9, when the multilayer material A is held between the upper side belt 15 and the lower side belt 14 for laminating purpose, the upper side belt 15 changes its shape along the outer shape of the multilayer material A.

On the other hand, as shown in Figs. 10 and 11, when the multilayer material A is conveyed, the upper side belt is lifted upward to be flat.

This means that the upper side belt 15 does not receive any force to press the multilayer material A against the lower side belt 14 in the conditions as shown in Figs. 10 and 11, and therefore these indicate that the multilayer material A is not held between the upper side belt 15 and the lower side 14.

The fact that the multilayer material A is not held between the upper side belt 15 and the lower side belt 14 is also evident from a gap between the upper side belt 15 and the multilayer material A, as clearly shown in Figs. 10 and 11.

It is clear that Shimotomai does not teach or suggest the feature of "holding the solar battery cells and the interconnectors transferred onto the heating belt between the heating belt and the press belt" as recited in claim 1, which again directly contradicts the Examiner's assertion. Again, Toyoma, Meyer and Tonari cannot correct this deficiency of Shimotomai.

As noted above regarding Shimotomai's laminating process, the multilayer material A is never moved while it is being laminated. Also, while the material is moved, it is never laminated. That is, laminating and transporting

never happens simultaneously. Thus, Shimotomai does not teach or suggest the feature of "soldering the interconnectors to the solar batteries cells while transporting the solar batteries cells and the interconnectors."

Shimotomai's deficiency goes even further. In Shimotomai, laminating and transporting cannot occur simultaneously for the following reason. In order to laminate the multilayer material A, the vacuum vessel must be put in an airtight situation by closing the lid 8. *Shimotomai, c.6, ll.17–25.* This necessarily requires that the multilayer material be prevented from moving.

Thus, Shimotomai actually teaches away from the above recited feature. Since Shimotomai directly teaches away, by definition, it is not combinable with any other references including Tonari. *See KSR v. Teleflex, 550 US 398, 127 S.CT. 1727 (2007) ("When the prior art teaches away from combining certain know elements, discovery of successful means of combining them is more likely to be non-obvious.").* Thus, Shimotomai and Tonari cannot teach or suggest the above-recited feature contrary to the Examiner's allegation. Toyoma and Meyer cannot correct this deficiency.

The combination of Shimotomai and Tonari fails in other regards as well. The Examiner recognizes that Shimotomai is not directed to soldering at all. The Examiner proposes to modify Shimotomai which discloses a process of laminating with Tonari which discloses tab-lead soldering. It is difficult to imagine how one of ordinary skill would modify the heating stage described in Shimotomai with the tab lead soldering process in Tonari so as to carry out

soldering instead of laminating. The examiner does nothing more than to assert that it would be obvious to do so.

On the contrary, one of ordinary skill would not modify Shimotomai such that solders would be melted instead rather than melting the fillers. Regarding the multilayer material A to be laminated, the photovoltaic modules are already interconnected electrically through interconnectors in Shimotomai. Thus, at the very least, there would be no need to replace the filler with solder since the modules are already interconnected. Further, laminating with solder as the Examiner proposes would compromise the functioning of the solar battery module.

In the Office Action, the Examiner rebuts by stating that one of ordinary skill would not make such modification because there would be no need to replace the filler with solder since the solar cells are already interconnected. *Office Action, Response to Amendments and Arguments, p.3.*

The Examiner is being inconsistent. Initially, the Examiner alleges that the teachings of Shimotomai can be modified with the teachings of Tonari so that cells and interconnectors will be soldered. When presented with logic showing that such modification would compromise the functioning of the solar battery module, the Examiner rebuts by asserting that one of ordinary skill would not do so since the cells are already interconnected, i.e., already soldered. The two positions taken by the Examiner on the same feature is diametrically opposed.

As indicated above, one of ordinary skill would not make combine Shimotomai and Tonari as the Examiner proposes. If one of the ordinary skill were to combine Shimotomai and Tonari, a more likely result would be the following. The soldering process taught in Tonari would be initially used to form the solar battery strings. Than the teachings disclosed in Shimotomai would be used to laminate the strings produced according to Tonari. The combination the Examiner proposes simply would not be conceived of by one of ordinary skill without the benefit of hindsight provided by the present disclosure. This is not permissible.

It is clear that the combination of Shimotomai and Tonari cannot teach or suggest that feature of "soldering the interconnectors to the solar battery cells while transporting the solar battery cells and the interconnectors." Toyoma and Tonari cannot correct this deficiency.

For at least the above stated reasons, the rejection of independent claim 1 based on Shimotomai, Toyoma, Meyer and Tonari is clearly erroneous. For similar reasons, the rejection of independent claim 3 based on the same references is also clearly erroneous.

Rejections of claims 2, 4, 11 and 12 are clearly erroneous at least by the virtue of their dependencies from claims 1 and 3. Shimotomai, Toyoma, Meyer and Tonari. Then at least by the virtue of their dependencies from claims 1 and 3, the rejections of claims 5-10, 25-26 and 27-28 are also clearly erroneous.

**B. Rejections of Dependent Claims 25 and 26 Clearly Erroneous**

As noted above, the rejections of claims 25 and 26 are clearly erroneous by virtue of their dependencies from independent claims 1 and 3. The rejections of these claims are also clearly erroneous on their own merits.

Claims 25 and 26 recite, in part "wherein at least one of the heating belt and the press belt is a metal belt." The Examiner admits that Shimotomai, Toyama, Meyer and Tonari do not disclose this feature. The Examiner relies upon Garbini to correct this deficiency. Reliance on Garbini is misplaced.

In the Office Action, the Examiner alleges that the steel belts lined with antiadhesive material disclosed in Garbini are analogous to the antiadhesive glass resin belts in Shimotomai. The Examiner asserts that it would have been obvious to one of ordinary skill to provide the metal belts in Shimotomai since doing so would avoid sticking/adhesion between the solar module and the belts. *Office Action, p.11.*

Even if the Examiner's assertion that the glass resin belts in Shimotomai can be replaced with steel belts taught in Garbini is taken to be true, the combination of Shimotomai and Garbini still fails. Shimotomai indicates that the lower side belt 14 is preferably made of glass cloth sheet immersed in resin having a releasing function. Shimotomai describes that one of the problems in the conventional art is that when the fillers are heated to melt by the heating plate, they overflow to stick on the heating plate. To solve this problem, the lower side belt 14 is made, by design, so that the filler material sticks on the lower side belt 14.

This is directly contrary to the purpose of lining the steel belt with antiadhesive material that Garbini is purported to teach by Examiner's own admission. Thus, even under the Examiner's own interpretation, Shimotomai and Garbini teach way from each other and cannot be combined. It is clear that the rejections of claims 25 and 26 are clearly erroneous.

**C. Rejections of Dependent Claims 27 and 28 Clearly Erroneous**

In addition to being dependent from claims 1 and 3, claims 27 and 28 are also distinguishable on their own merits. Claims 27 recites, in part "wherein the solar battery cells and the interconnectors transported to the downstream portion of the positioning belt are held between the positioning belt and the press belt, and successively transferred from a downstream end of the positioning belt onto the heating belt while being pressed by the press belt."

As demonstrated the above, Shimotomai does not teach or suggest holding the solar cell between the heating belt and the press belt and does not feature suggest holding the solar cell between the positioning belt and the press belt.

Kataoka is equally deficient. The entirety of Kataoka's abstract is reproduced below:

> PROBLEM TO BE SOLVED: To simply and efficiently mass-produce a material to be laminated, to construct a production line high in through-put and to laminate a long material to be laminated at the time of lamination by continuous feed by using a relatively small-sized and inexpensive apparatus. SOLUTION: A laminating apparatus heating a material 102 to be laminated to bond the same under pressure has a continuously supplied membrane-like member 101, the lower chamber 104 arranged

> under the membrane-like member 101 and the upper chamber 103 arranged above the membrane like member 101 and having a plate-shaped member provided therein and the laminate 102 to be laminated is held between the upper and lower chambers along with the membrane-like member 101 and the pressure in the upper chamber is made less than that in the lower chamber to press the membrane-like member 101 to the plate-shaped member and the material 102 to be laminated is held between the membrane-like member 101 and the plate-shaped member under pressure.

Just like Shimotomai, Kataoka transports the material to be laminated into the processing chamber, processing is performed in vacuum, and the laminated material is then removed. There is nothing in Kataoka that even remotely suggests the laminated material being held between the belts.

It is clear that the rejections of claims 27 and 28 are erroneous.

## CONCLUSION

In conclusion it is believed that the application is in clear condition for allowance; therefore, early reversal of the Final Rejection and passage of the subject application to issue are earnestly solicited.

Respectfully submitted,

**NIXON & VANDERHYE P.C.**

By: _____
Hyung N. Sohn
Reg. No. 44,346

HNS/edg
901 North Glebe Road, 11th Floor
Arlington, VA 22203-1808
Telephone: (703) 816-4000
Facsimile: (703) 816-4100

## (VIII) CLAIMS APPENDIX

1. A production method for a solar battery module, comprising:

utilizing a production apparatus including a positioning belt and a heating belt located adjacent each other in a transferable manner and a press belt extending over the positioning belt and the heating belt in opposed relation to the positioning belt and the heating belt such that the press belt overlaps at least a portion of the positioning belt, the positioning belt having a vacuum suction hole, and the heating belt having no suction hole, and adapted to control the heating belt and the press belt at predetermined temperatures;

positioning a plurality of solar battery cells and interconnectors required for connection of the solar battery cells on an upstream portion of the positioning belt and transporting the solar battery cells and the interconnectors to a downstream portion of the positioning belt while holding the solar battery cells and the interconnectors in a properly positioned state by the action of the vacuum suction hole;

transferring the solar battery cells and the interconnectors transported to the downstream portion of the positioning belt onto the heating belt while holding the solar battery cells and the interconnectors between the positioning belt and the press belt; and

holding the solar battery cells and the interconnectors transferred onto the heating belt between the heating belt and the press belt and soldering the interconnectors to the solar battery cells while transporting the solar battery cells and the interconnectors.

2. The solar battery module production method as set forth in claim 1, wherein at least a surface of the positioning belt is composed of a resin.

3. The solar battery module production apparatus to be used for a solar battery module production method as recited in claim 1, the production apparatus comprising:

a positioning belt and a heating belt located adjacent each other in a transferable manner; and

a press belt extending over the positioning belt and the heating belt in opposed relation to the positioning belt and the heating belt,

wherein the heating belt and the press belt are each controlled at a predetermined temperature, the press belt overlaps at least a portion of the positioning belt, the positioning belt has a vacuum suction hole, and the heating belt has no suction hole.

4. The solar battery module production apparatus as set forth in claim 3, wherein at least a surface of the positioning belt is composed of a resin.

5. The solar battery module production method as set forth in claim 1, wherein the production apparatus further comprises at least one lower resilient member which biases the heating belt towards the press belt and at

least one upper resilient member which biases the press belt toward the heating belt.

6. The solar battery module production method as set forth in claim 5, wherein one or both the at least one upper and at least one lower resilient members are leaf springs.

7. The solar battery module production apparatus as set forth in claim 3, further comprising: at least one lower resilient member which biases the heating belt towards the press belt; and at least one upper resilient member which biases the press belt towards the heating belt.

8. The solar battery module production apparatus as set forth in claim 7, wherein one or both the at least one upper and at least one lower resilient members are leaf springs.

9. The solar battery module production method as set forth in claim 5, wherein a number of upper resilient members is less than a number of lower resilient members.

10. The solar battery module production apparatus as set forth in claim 7, wherein a number of upper resilient members is less than a number of lower resilient members.

11. The solar battery module production method as set forth in claim 1, wherein the production apparatus further comprises a lower heating block disposed on a back side of the heating belt and an upper heating block disposed on a back side of the press belt, the upper and lower heating blocks adapted to heat solar cells of the solar battery module; and

a lower cooling block disposed on the back side of the heating belt and an upper cooling block disposed on a back side of the press belt, the upper and lower cooling blocks adapted to cool the solar cells of the solar battery module.

12. The solar battery module production apparatus as set forth in claim 3, further comprising:

a lower heating block disposed on a back side of the heating belt and an upper heating block disposed on a back side of the press belt, the upper and lower heating blocks adapted to heat solar cells of the solar battery module; and

a lower cooling block disposed on the back side of the heating belt and an upper cooling block disposed on a back side of the press belt, the upper and lower cooling blocks adapted to cool the solar cells of the solar battery module.

Claims 13-24 (Canceled)

25. The solar battery module production method as set forth in claim 1, wherein at least one of the heating belt and the press belt is a metal belt.

26. The solar battery module production apparatus as set forth in claim 3, wherein at least one of the heating belt and the press belt is a metal belt.

27. The solar battery module production method as set forth in claim 1, wherein the solar battery cells and the interconnectors transported to the downstream portion of the positioning belt are held between the positioning belt and the press belt, and successively transferred from a downstream end of the positioning belt onto the heating belt while being pressed by the press belt.

28. The solar battery module production method as set forth in claim 27, wherein one part of each solar battery cell is held between the heating belt and the press belt while another part of the solar battery cell is held between the positioning belt and the press belt, when the solar battery cell is transferred from the positioning belt onto the heating belt.

## (IX) EVIDENCE APPENDIX

None

## (X) RELATED PROCEEDINGS APPENDIX

None